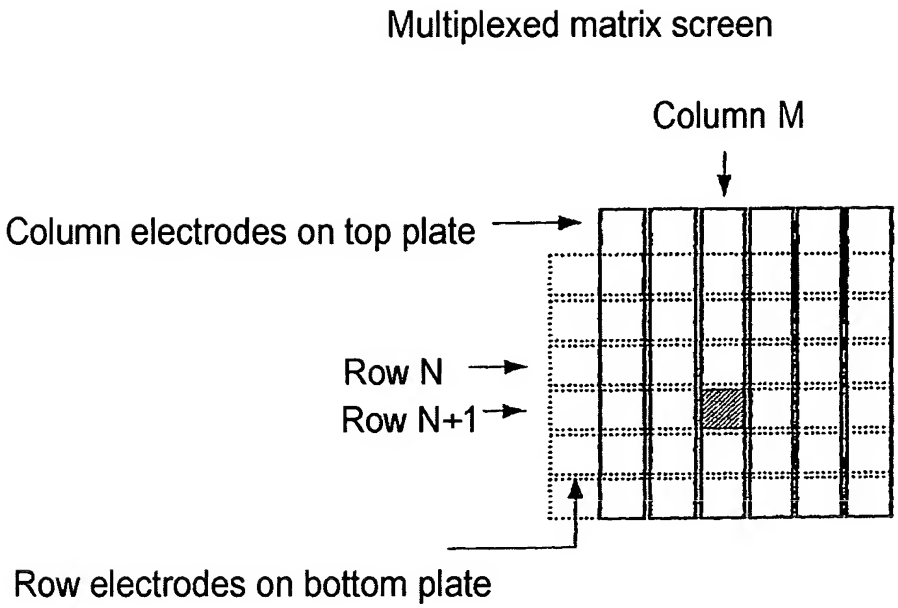

Multiplexed matrix screen
Column M
Column electrodes on top plate
Row N
Row N+1
Row electrodes on bottom plate

FIG.1

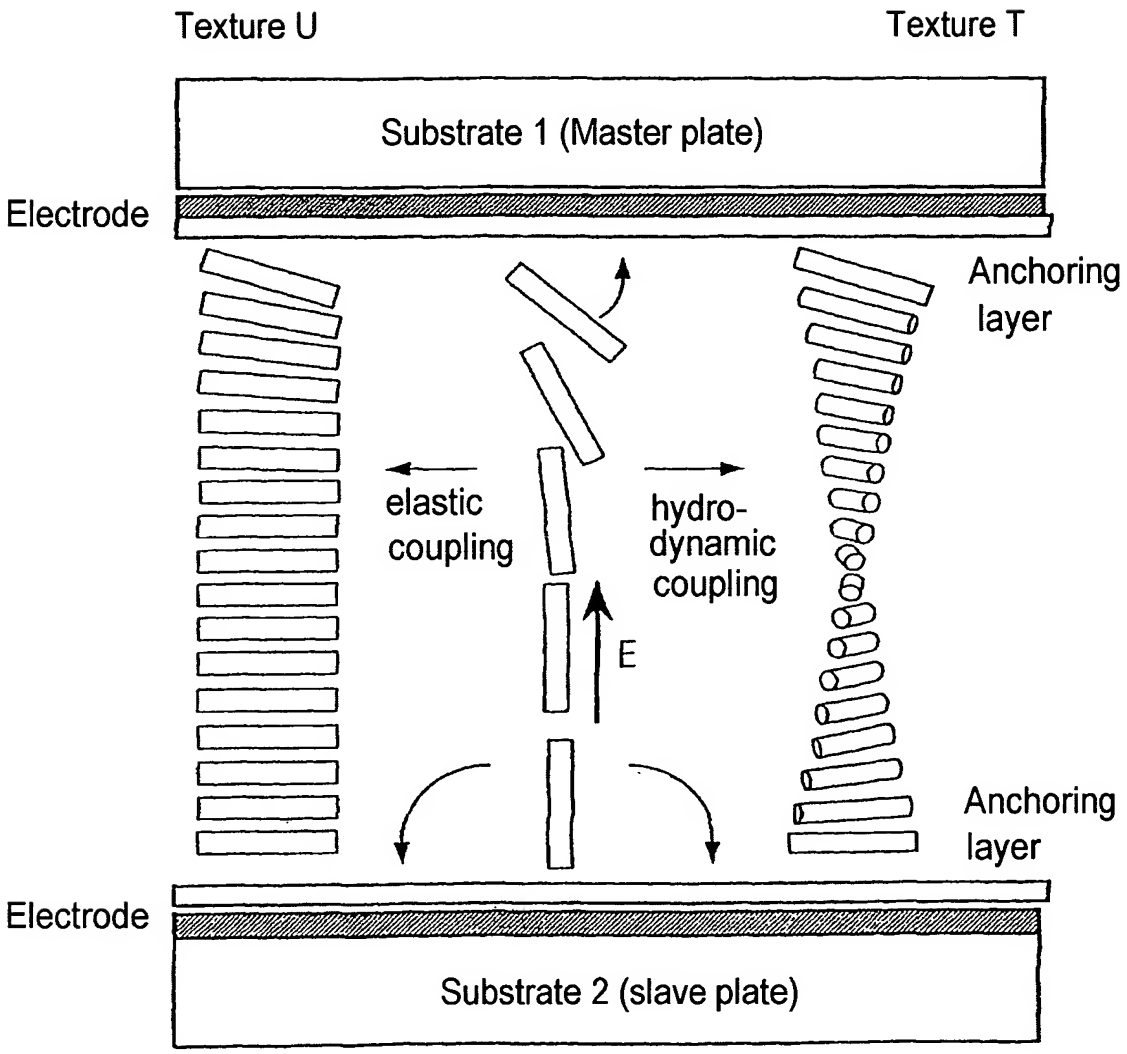

BiNem screen principles
Texture U
Texture T
Substrate 1 (Master plate)
Electrode
Anchoring layer
elastic coupling
hydro-dynamic coupling
E
Anchoring layer
Electrode
Substrate 2 (slave plate)

FIG.2

Pixel switching signals

Write signals: switching to the twisted texture T

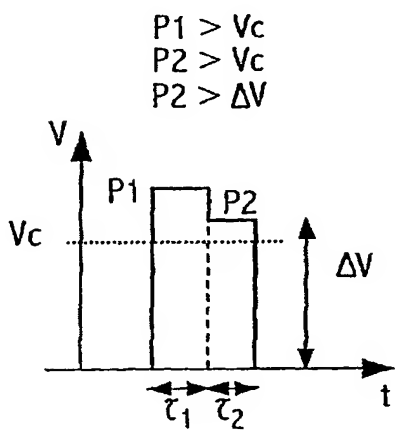


FIG.3a1

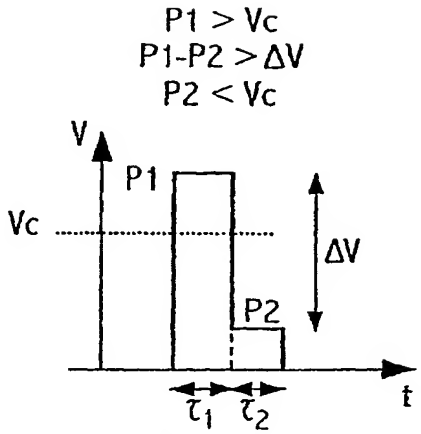
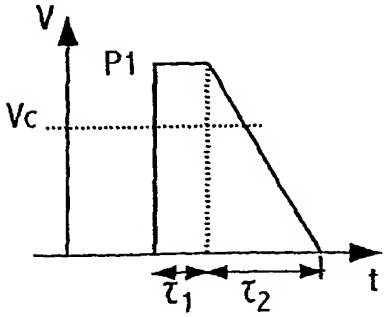


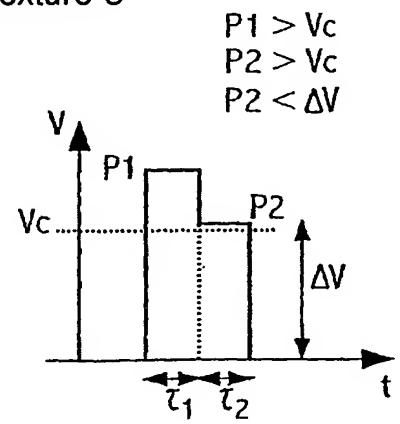
FIG.3a2

Delete signals: switching to the uniform texture U



Slow drop by ramp

FIG.3b1



Slow drop by staircase
Two plateaus

FIG.3b2

FIG.3

Electrooptical behaviour of a BiNem pixel addressed by a two-plateau pulse

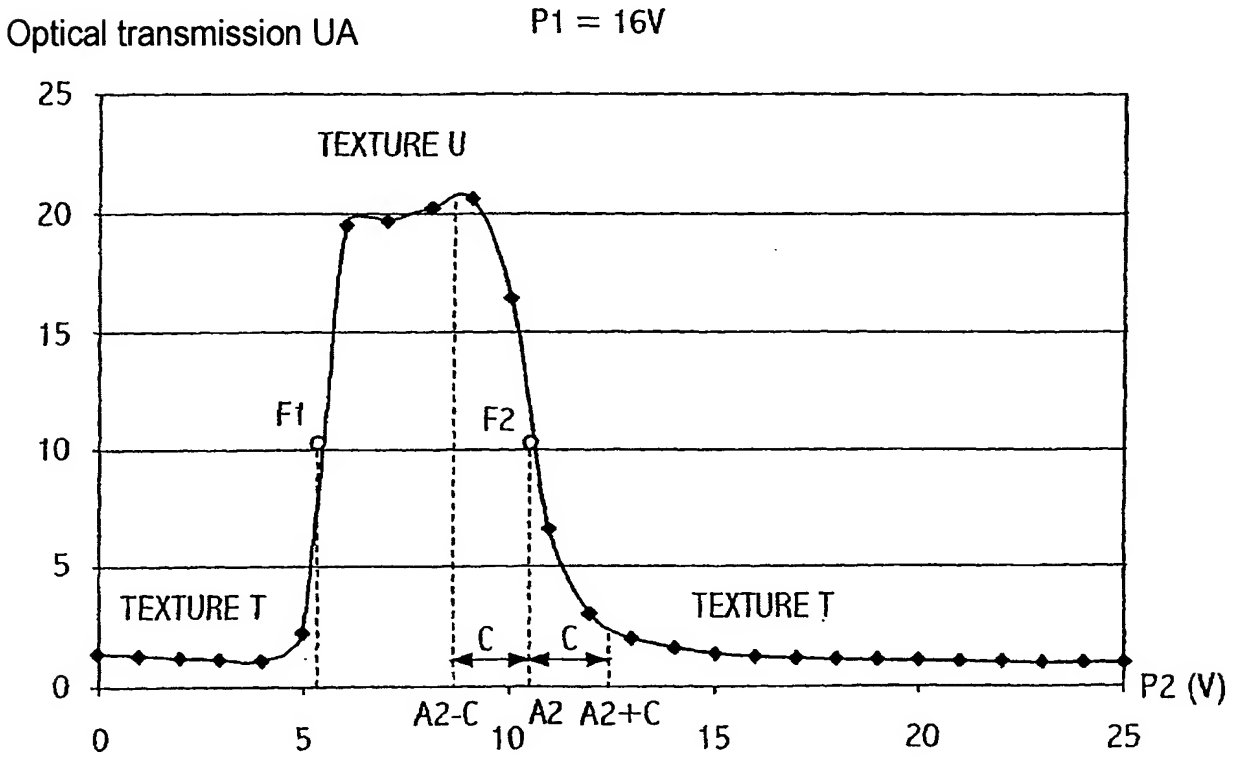


FIG.4

Writing or deleting as a function of the value of the second plateau across the pixel terminals and corresponding to the electrooptical curve of Fiigure 4

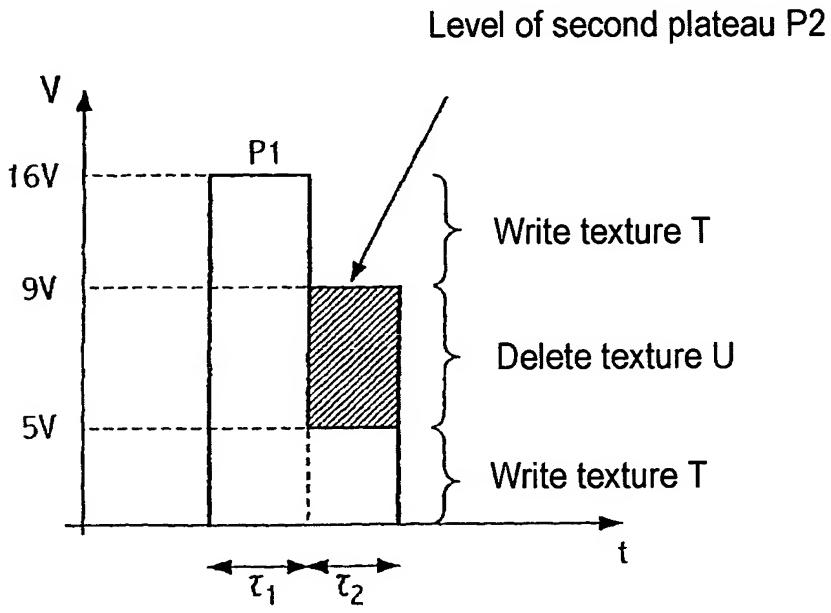
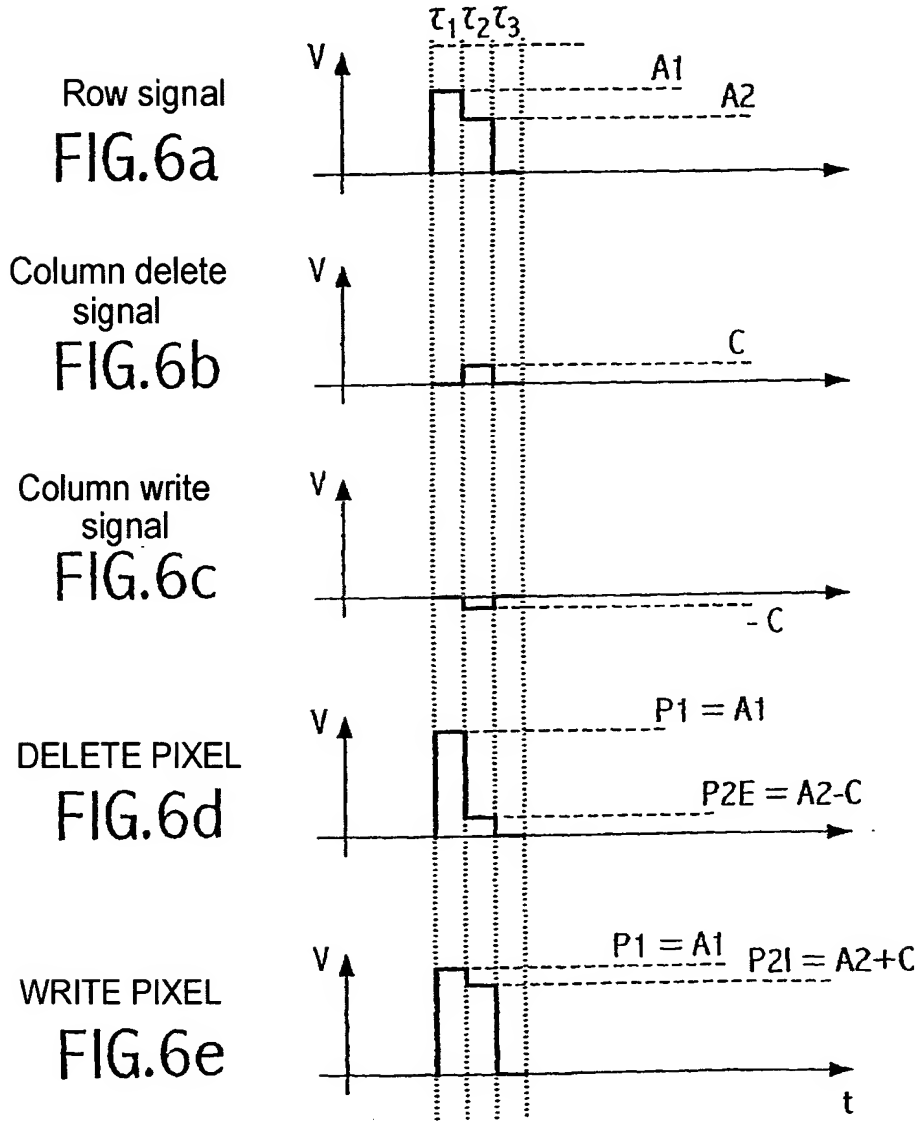


FIG.5

Signals applied to the electrodes



Row signal
FIG.6a

Column delete signal
FIG.6b

Column write signal
FIG.6c

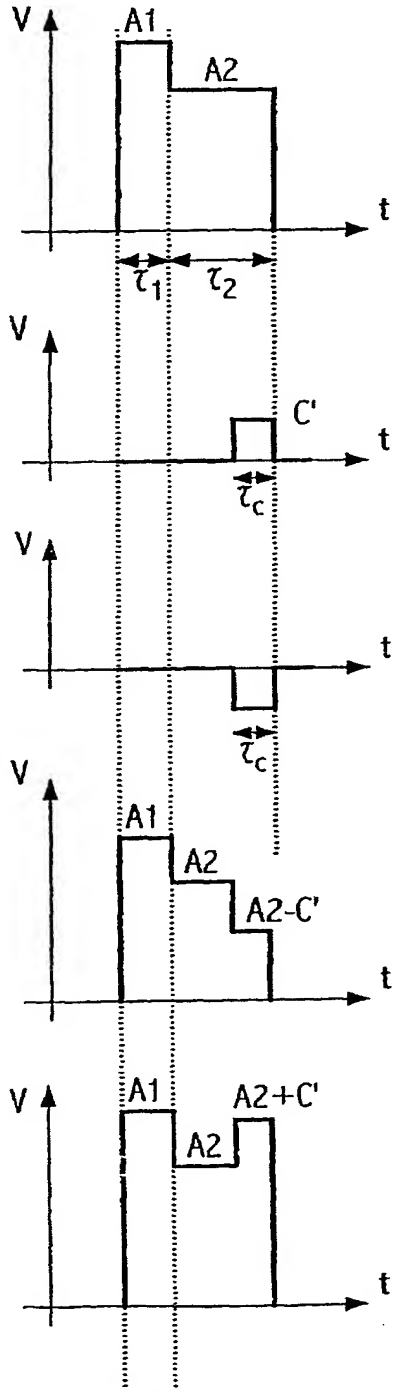
DELETE PIXEL
FIG.6d

WRITE PIXEL
FIG.6e

FIG.6

Column signal waveform - Example 1

Column signal in the form of squarewave pulses



Row signal

FIG.7a

Column delete signal

FIG.7b

Column write signal

FIG.7c

DELETE PIXEL

FIG.7d

WRITE PIXEL

FIG.7e

FIG.7

Column signal waveform - Example 2 - Illustration 1

Column signal in the form of ramps

Row signal

FIG.8a

Column delete signal

FIG.8b

Column write signal

FIG.8c

DELETE PIXEL

FIG.8d

WRITE PIXEL

FIG.8e

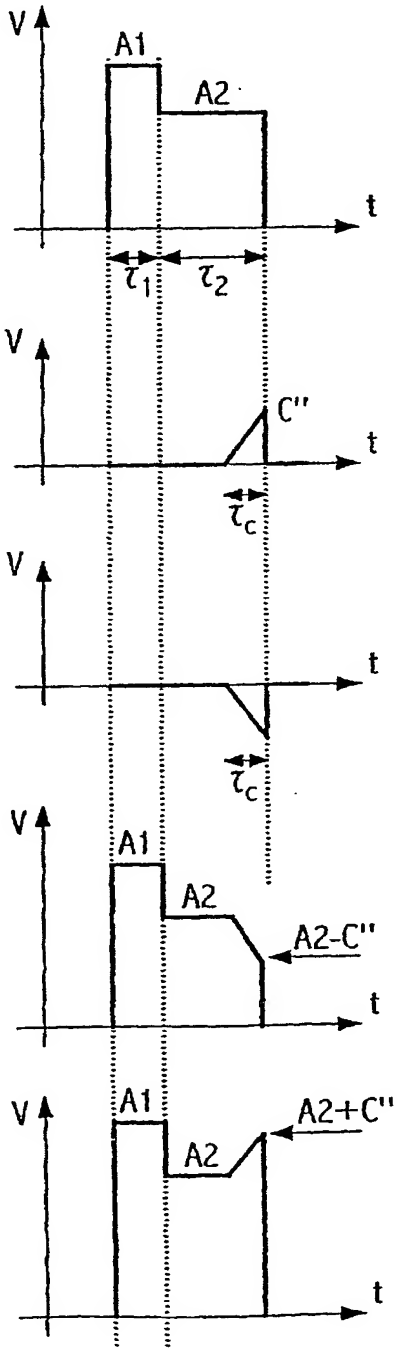


FIG.8

Column signal waveform - Example 2 - Illustration 2

Column signal in the form of two plateaus

Row signal

FIG.9a

Column delete signal

FIG.9b

Column write signal

FIG.9c

DELETE PIXEL

FIG.9d

WRITE PIXEL

FIG.9e

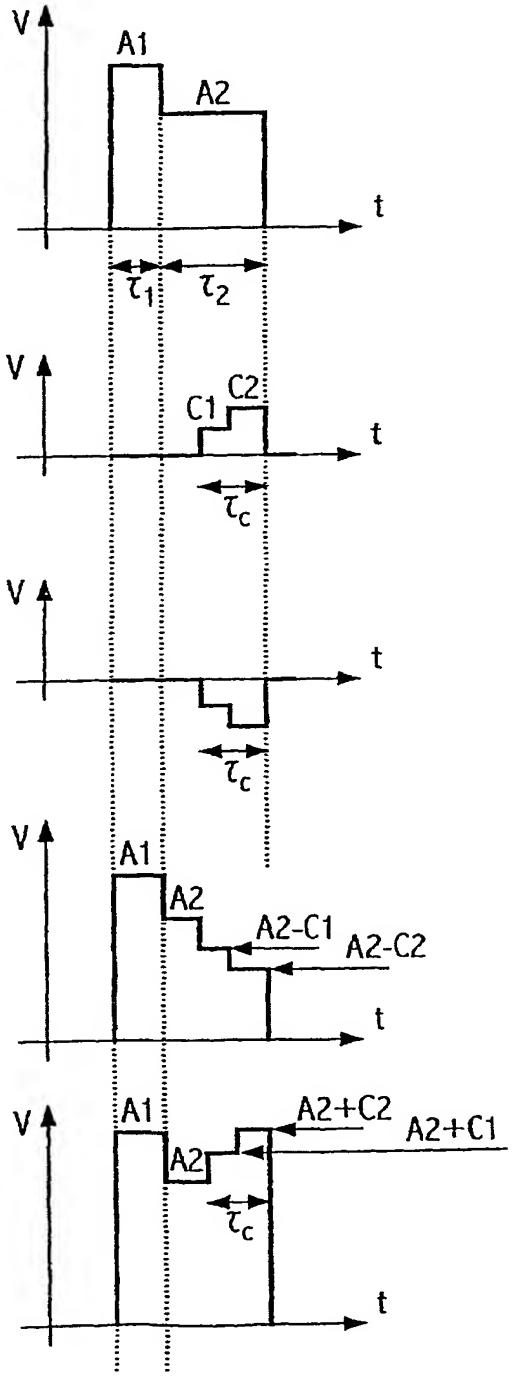


FIG.9

Symmetrical signals of zero mean value over row duration "row symmetrization"

Row signal

FIG.10a

Column delete signal

FIG.10b

Column write signal

FIG.10c

DELETE PIXEL

FIG.10d

WRITE PIXEL

FIG.10e

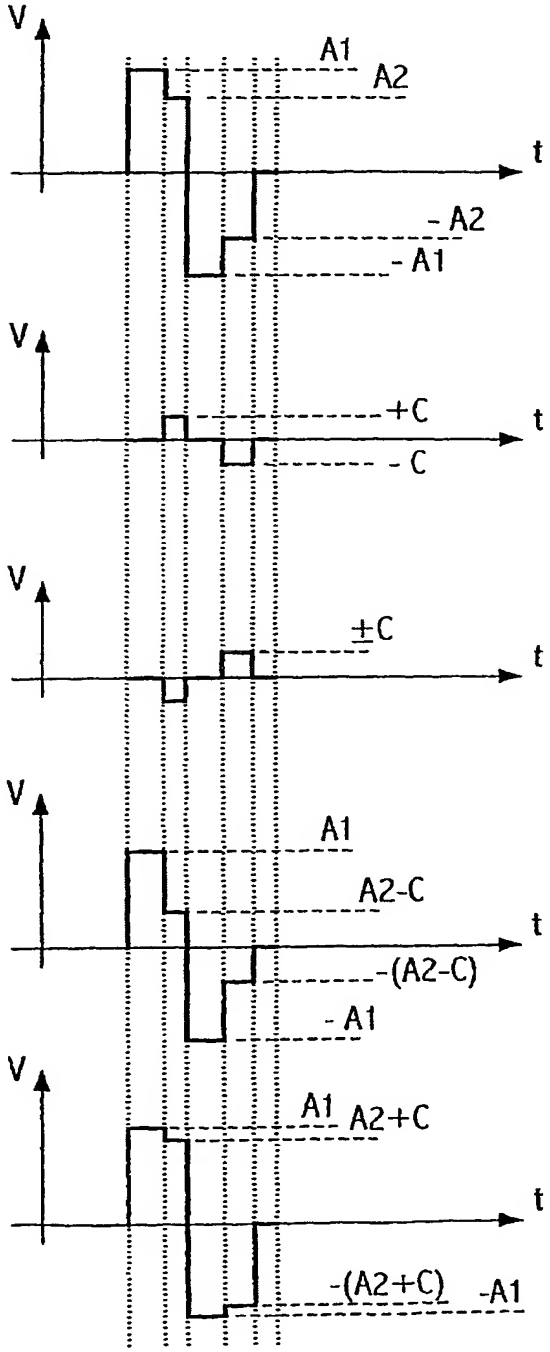


FIG.10

Signals symmetrized by changing polarity on each image

"frame symmetrization"

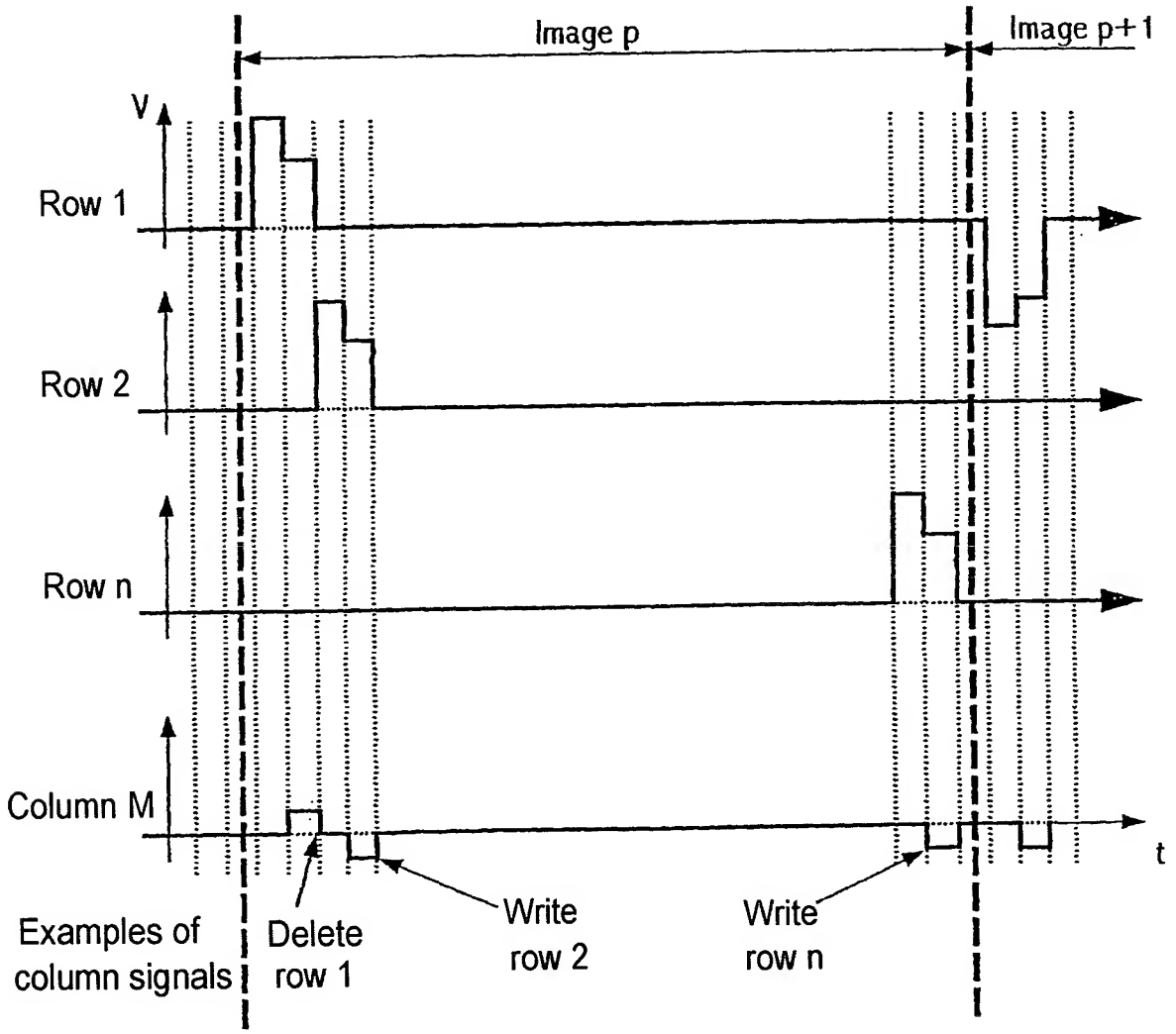
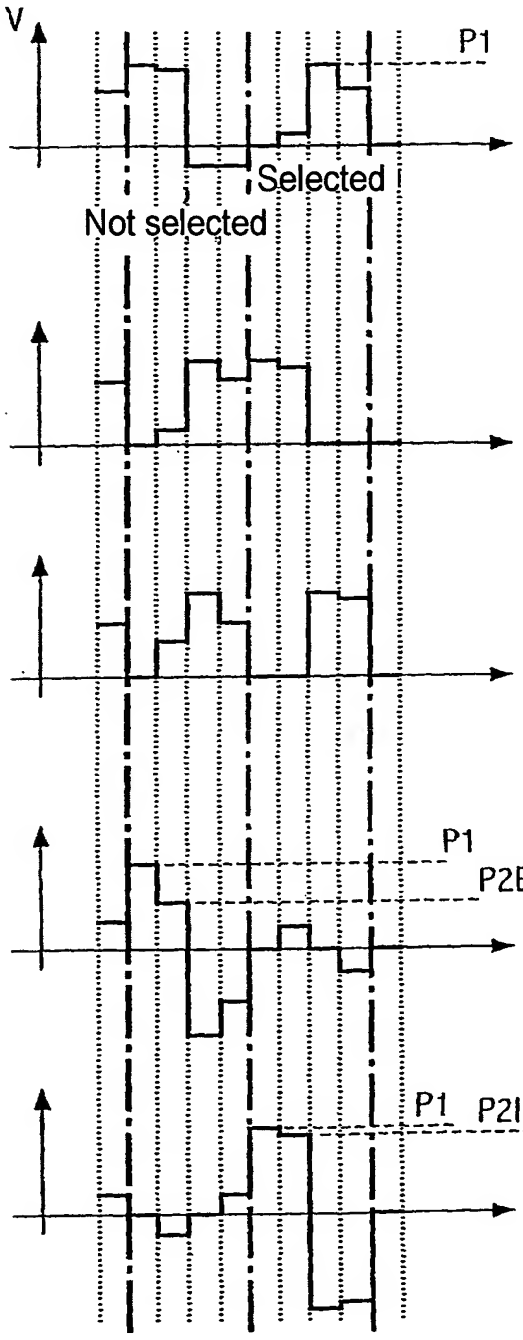


FIG.11

Symmetrical signals of constant polarity and reduced excursion



Row N
FIG.12a

Row N+1
FIG.12b

Column M
FIG.12c

Delete
pixel M,N
FIG.12d

Write
pixel M,N+1
FIG.12e

The 5 row signal levels are: 0 ; (P2I-P2E)/2 ; (p2I+P2E)/2 ; P2I ; P1.
The 5 column signal levels are 0 ; (P2I-P2E) ; P2E ; P2I ; P1.
The pixel voltages are: 0 ; ±(P2I-P2E)/2 ; ±P2E ; ±P2I ; ±P1.
The rms interfering signal is: $\tau_2(P2I-P2E)^2/4(\tau_1+\tau_2)$.

FIG.12

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows - No symmetrization

Example of addressing 7 rows at a time

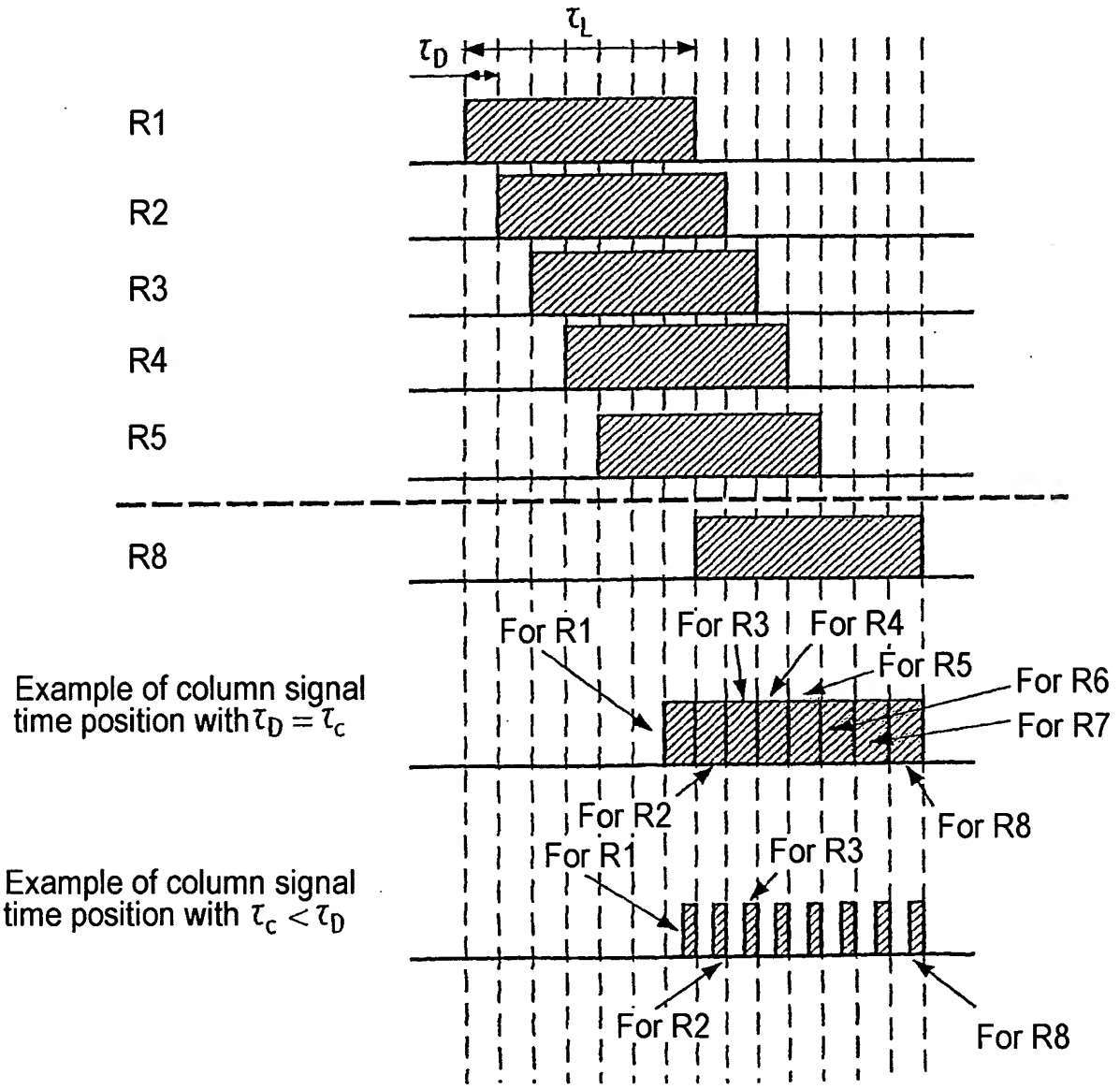


FIG.13

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows - Frame symmetrization

Example of addressing 3 rows at a time

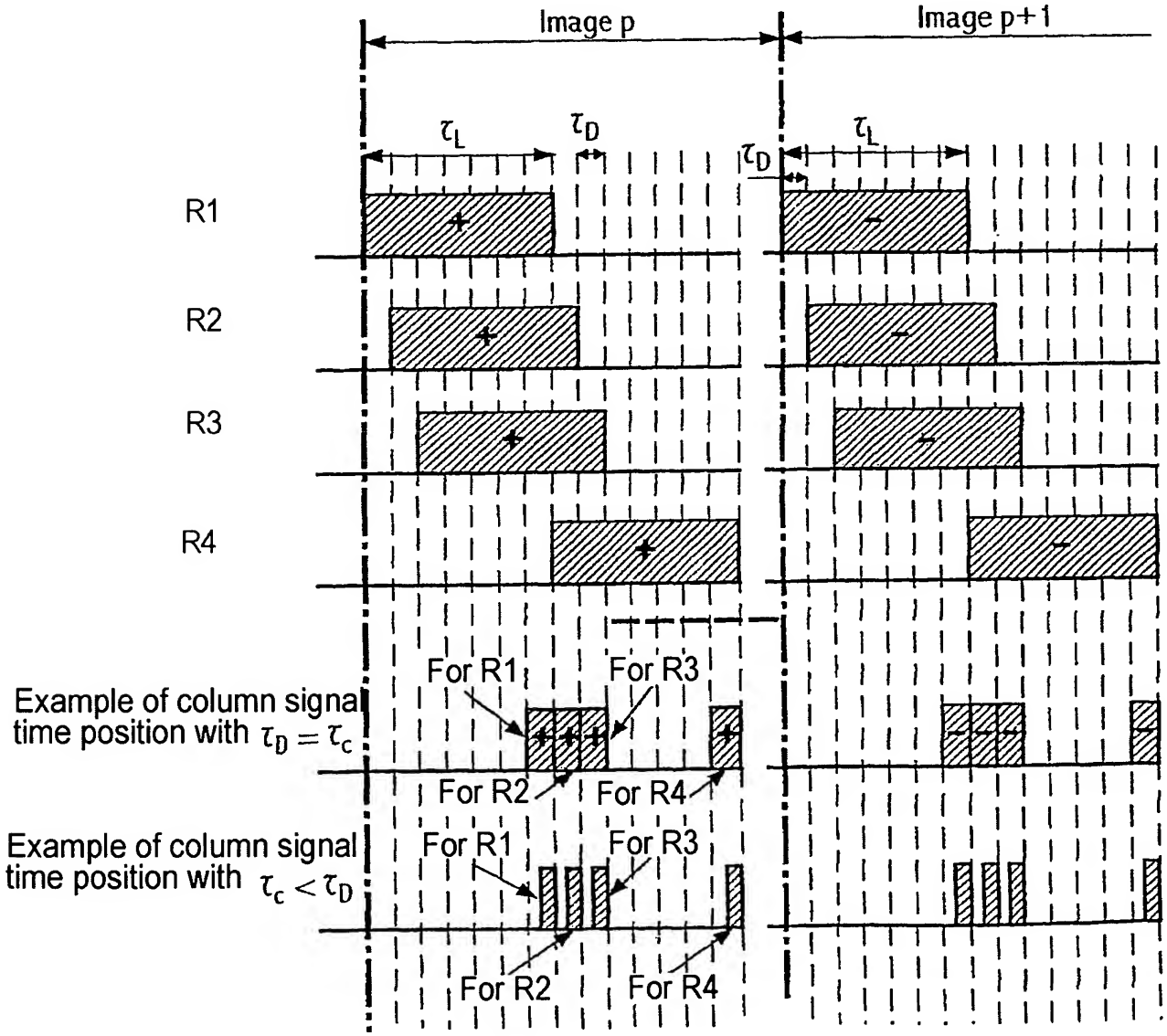


FIG.14

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows - Row and frame symmetrization

Example of addressing 3 rows at a time

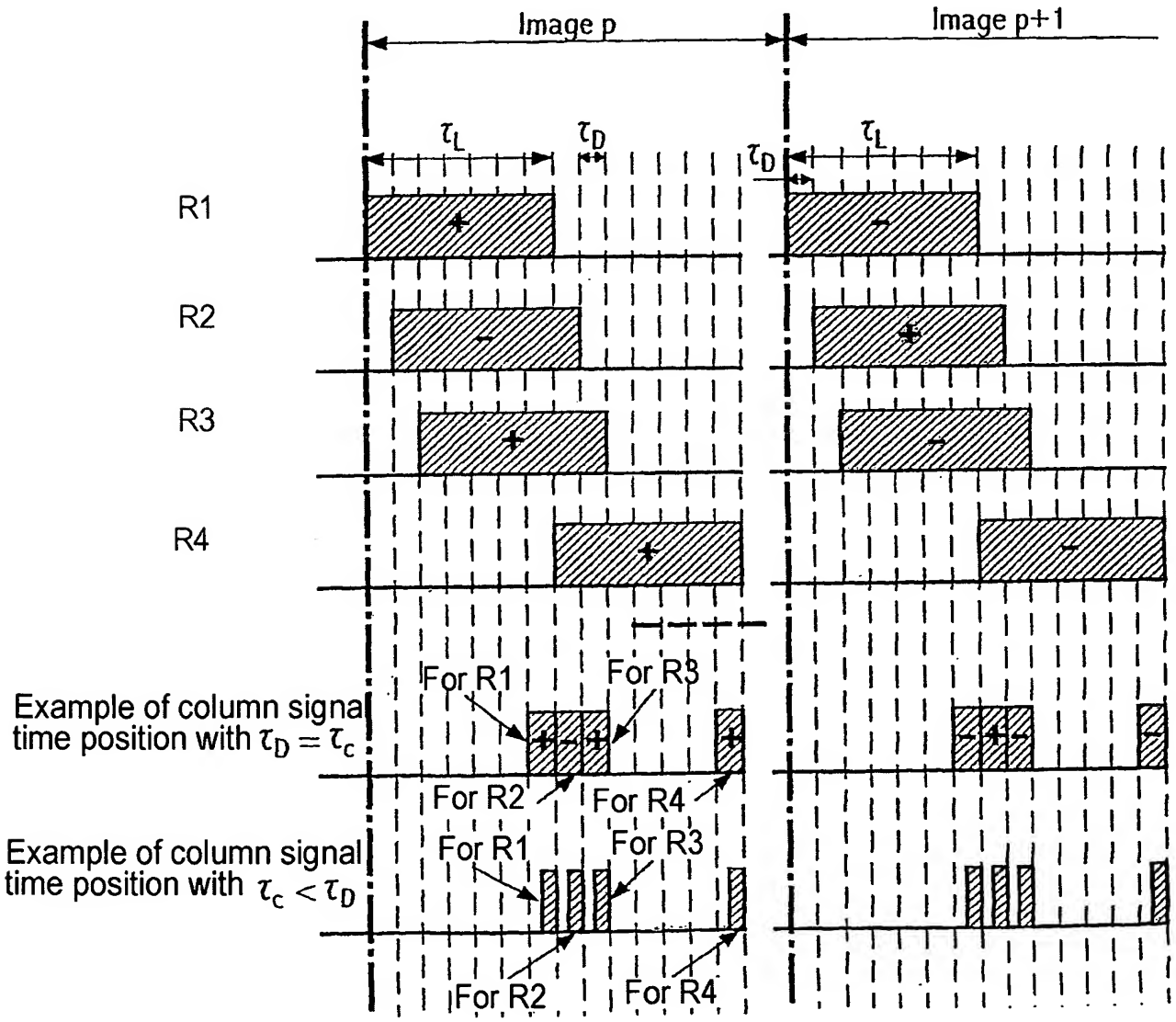


FIG.15

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows - Total row symmetrization

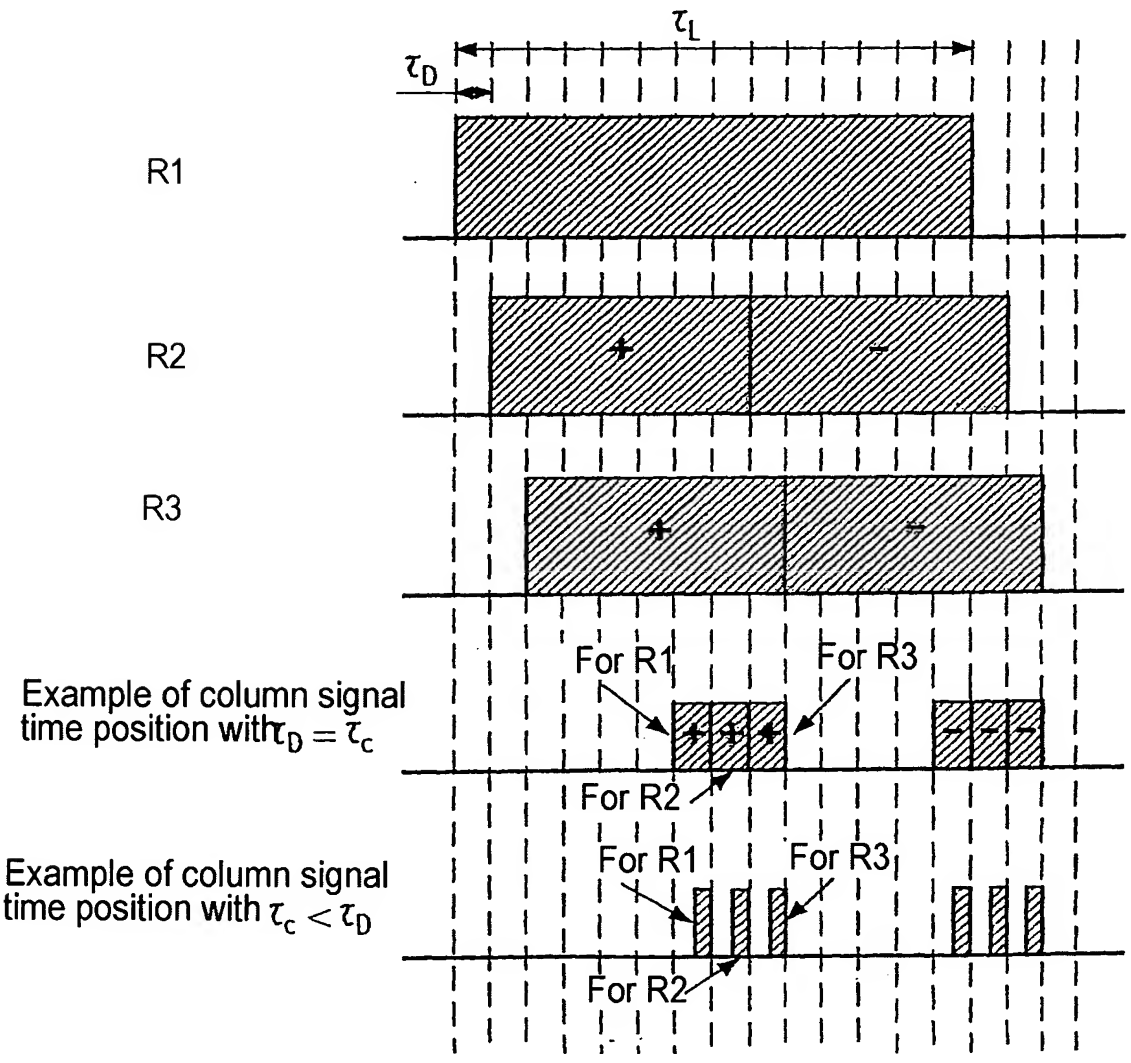


FIG.16

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows - Partial row symmetrization

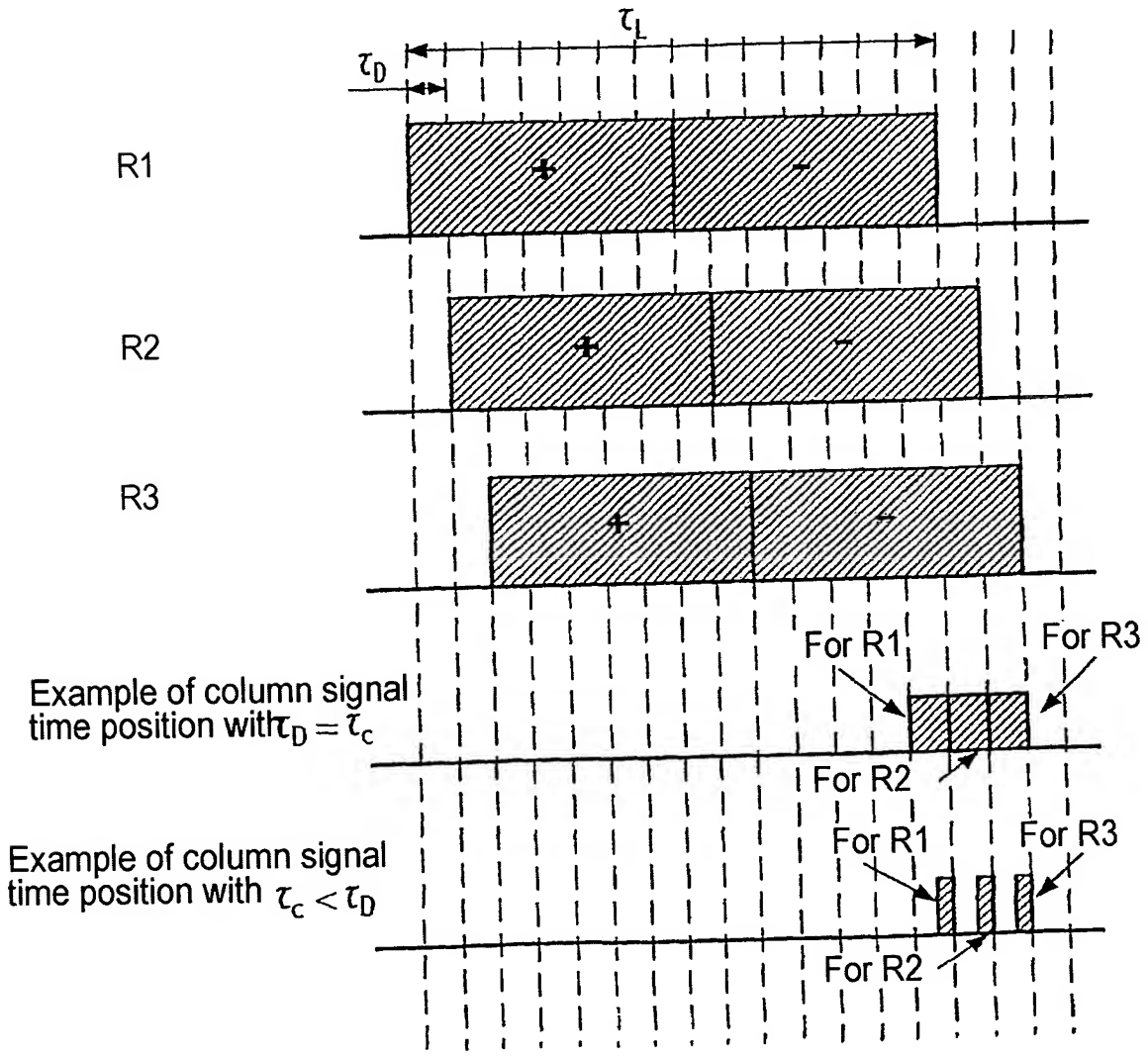


FIG.17

Adressing a BiNem screen with time overlap of row address pulses

Variant 2: non-consecutive rows

Example of addressing 3 rows at a time

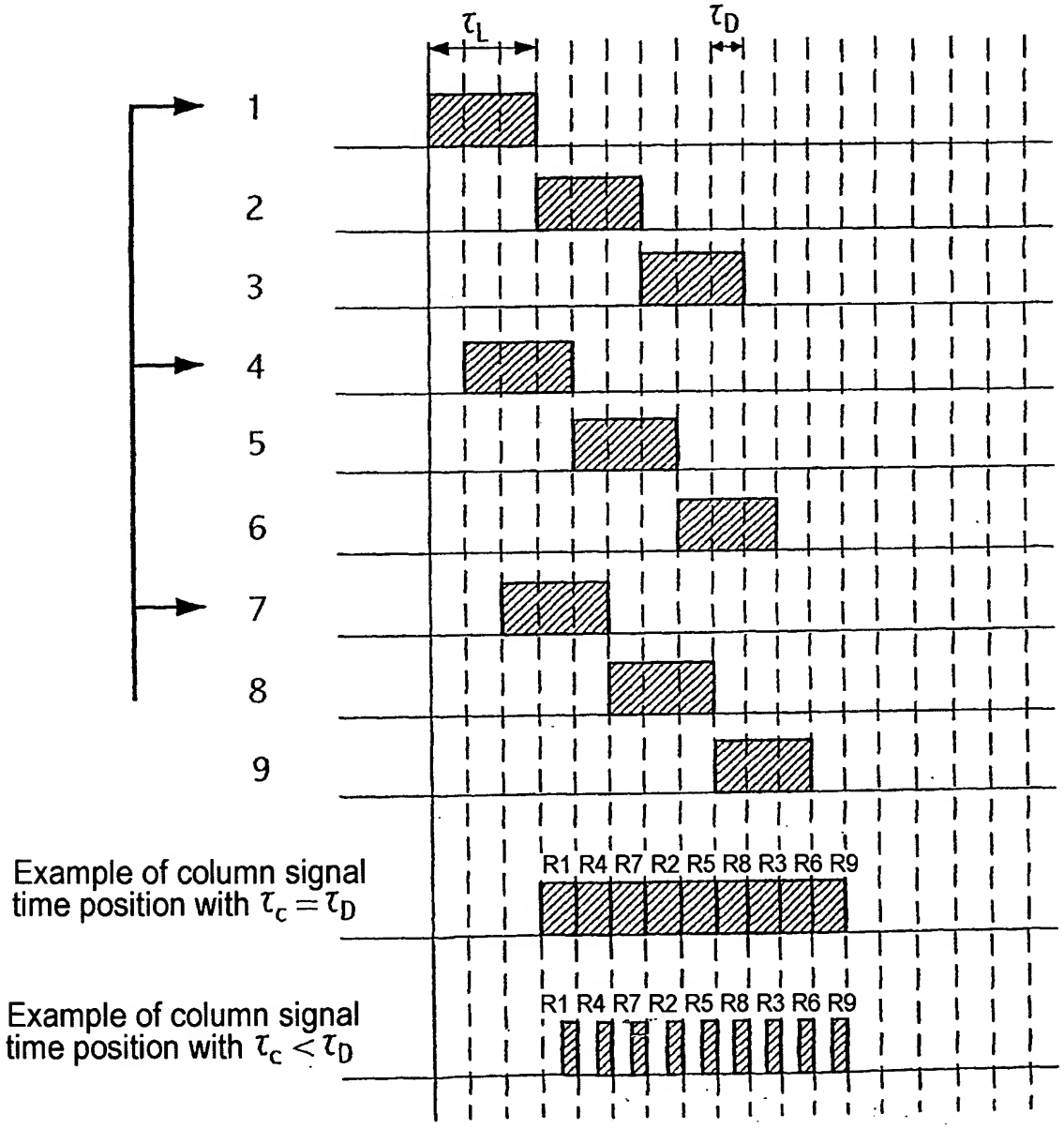


FIG.18

Adressing a BiNem screen with time overlap of row address pulses

Variant 1: consecutive rows

Two-plateu row signal - Squarwave column signal

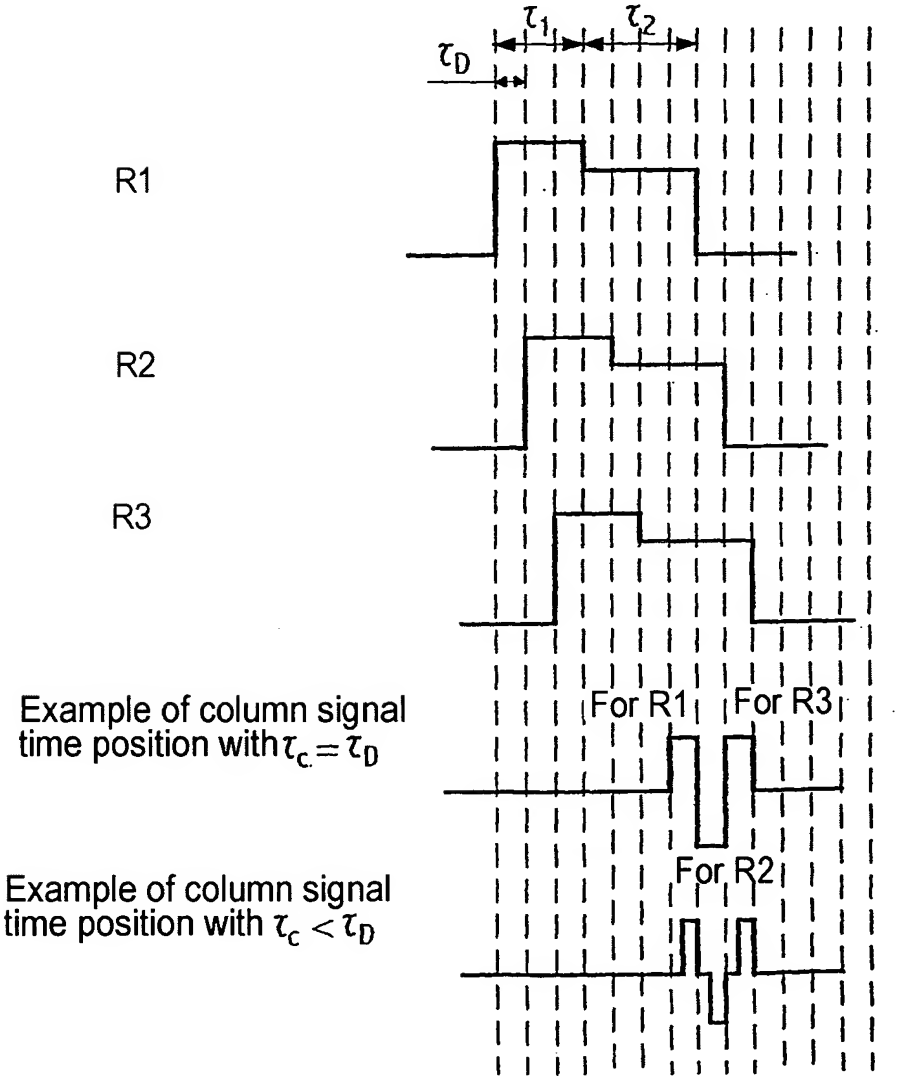


FIG.19

Example of row pulse waveform for addressing a BiNem screen with time overlap of row address pulses

3 plateau row signal during anchoring breaking stage C

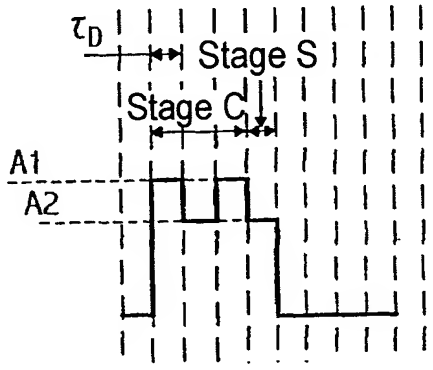


FIG.20

Example of row pulse waveform for addressing a BiNem screen with time overlap of row address pulses

5 plateau row signal during anchoring breaking stage C

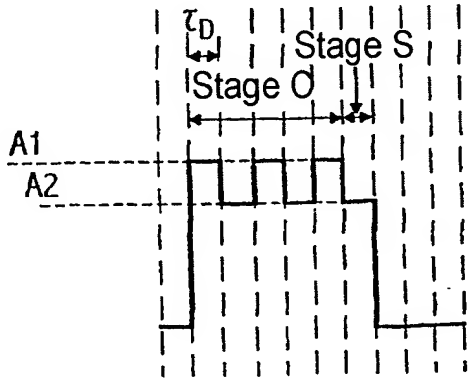


FIG.21